REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Status of the Claims:

Claims 1 and 4 are amended. In particular, claims 1 and 4 are amended to recite, among other features, a superconducting layer having a layer thickness of 1.5 μm to 3 μm. (Original Specification; Table 1) The amendment further clarify and distinguish claims 1 and 3-11.

Claim Rejections under 35 USC 103:

Claims 1 and 3-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Onabe et al. (U.S. Publication No. 2003/0134749). This rejection is respectfully traversed because i) Onabe et al. fails to teach, suggest or render predictable features of independent claims 1 and 4, and ii) features of claims 1 and 4 are of a critical nature and create new unexpected results.

i) Onabe et al. Fails to Teach, Suggest or Render Predictable Features of Independent Claims 1 and 4.

Independent claims 1 and 4, as amended recite, among other features, a method of producing a superconductor wire, comprising the steps of

forming a superconducting layer on a base layer by performing a film deposition at least three times . . .

a film thickness of a superconducting film made in each film deposition is 0.3 μm or less and the superconducting layer having a layer thickness of 1.5 μm to 3 μm is formed on the base layer.

Onabe et al. fails to teach, suggest or render predictable a film thickness of a superconducting film in each film deposition of 0.3 μm or less, at least three film depositions

and a layer having a thickness of 1.5 μm to 3 μm. Instead Onabe et al. discloses a layer having a thickness of 0.54 μm to 0.87 μm. (Onabe et al.; Tables 3, 4, 6, 8 and 10) Accordingly, the Office Action of August 8, 2007 acknowledged that Onabe et al. does not disclose how many times the deposition takes place and the thickness of the superconducting films. (Office Action of August 8, 2007; page 3, lines 9-14).

Nonetheless, the Office Action asserts that one of ordinary skill in the art would recognize that the process could be repeated until the desired thickness is obtained. However, Onabe et al. admitted that they were unable to obtain a high critical current density (Jc) value as achieved by the Applicants. (Onabe et al.; paragraph [0013]) Unlike the result of the claimed features, both Onabe et al. and the original specification acknowledge that having a high thickness of the superconducting layer can lead to a decrease in Jc. (Onabe et al., Table 1 and Original Specification Table 1)

However, the features of claim 1 and 4 can produce a high current density (Jc) and a high critical current (Ic) while having a thick superconducting layer (1.5 μm to 3 μm which is two times the thickness of Onabe et al.; Table 1). (Original Specification; Table 1, claims 1 and 4) The Applicants were able to achieve these results by increasing the number of times of film deposition and reducing each film deposition to 0.3 μm or less. (Original Specification; Table 1, claims 1 and 4) The prior art of record does not teach, suggest or render predictable the above noted features. One of ordinary skill in the art would not recognize that the process should be repeated or the thickness of each deposition should be 0.3 μm or less through routine experimentation.

Thus one of ordinary skill in the art would not through routine experimentation ascertain the features of claims 1 and 4. Therefore, it is believed that for at least the reasons stated above claims 1 and 4 are believed to be allowable.

ii) Critical Nature of the Claimed Features and New Unexpected Results.

The Office Action of August 8, 2007 states that the specification contains no disclosure of either the critical nature of the claimed a) Supply area velocity, b) Times of film

deposition and c) Critical current and unexpected results. (Office Action of August 8, 2007, page 5).

a) Supply Area Velocity

The specification as filed at page 8, line 18 to page 9, line 2, states the following:

> "In the method for producing the superconductor according to the present invention, the supply area of the base layer per hour (hereinafter referred to as supply area velocity of the base layer) in each film deposition can be at least 0.04 m^2/h. **If the supply area velocity of the base layer is less than 0.04 m2/h when the substrate corresponds to the adjacent base layer, in some cases the reaction between the substrate and the superconducting layer formed thereon increases, whereby characteristics of the superconducting layer such as Ic and Jc are deteriorated**."
> (Specification; page 8, line 18 to page 9, line 2).

Thus, the specification does contain disclosure of the importance of having a supply area velocity of a base layer in each film deposition that is at least 0.04 m^2/h. This is because if the supply area velocity of the base layer is less than 0.04 m^2/h when the substrate corresponds to the adjacent base layer, in some cases the reaction between the substrate and the superconducting layer formed thereon increases, whereby characteristics of the superconducting layer such as Ic and Jc are deteriorated. (Specification; page 8, line 18 to page 9, line 2).

In Onabe et al., for the purpose of preventing diffusion of elements contained in a base layer, an element diffusion prevention layer is provided. In contrast, with embodiments of the present invention, by increasing the supply area velocity, the reaction time is shortened so that a diffusion of elements contained in the base layer may be prevented. Thus, the element diffusion prevention method in Onabe et al. is different from the technique of preventing element diffusion of embodiments of the present invention.

b) Times of Film Deposition

The specification as filed at page 15, line 16 to page 16, line 5, states the following:

> In the case where the superconducting layer was deposited once, as shown in Comparative Example 7, when the thickness of the superconducting layer was 1.75 μm, the Jc and the Ic became zero. In contrast, in the case where the superconducting layer was deposited at least two times, the Ic was increased **as the number of times of the film deposition was increased**. Thus, in the superconductor (Example 5) including the superconducting layer having a thickness of **1.5 μm prepared by performing the film deposition six times, the Ic increased to 300 A/cm-width**, and the Ic remained about 300 A/cm-width in the subsequent examples in which **the number of times of the film deposition was increased to the case of the superconducting layer having a thickness of 3.0 μm prepared by performing the film deposition twelve times** (Example 9). However, when the thickness of the superconducting layer exceeds 3.0 μm, the Jc drastically decreased, resulting in decrease of the Ic.

Thus, the original specification does disclose that increasing the number of times of the film deposition can increase the Ic and the Jc. As shown in Table 1 of the original specification when the number of times of film depositions is increased to at least three, both the critical current density and the critical current are increased.

c) Critical Current and Unexpected Results

The currents (Jc and Ic) achieved by features recited in claims 1 and 4, as amended are critical, unexpected and disclosed by the original specification.

The unexpected result of the above features is disclosed to be a critical current (Ic) in the range of 297.5 to 325 A/cm (Original Specification Table 1) when compared to Onabe et al. the critical current (Ic) of 1.25 A/cm to 26.3 A/cm. (Onabe et al. Tables 1 through 4) The

Ic of the claimed features is 10 times greater or one order of magnitude higher than that of Onabe et al., making the results unexpected.

Similarly, the critical current density (Jc) of the current invention is in the range of 1.0 to 2.0 MA/cm^2 where as the critical current density (Jc) disclosed in Onabe et al. is in the range of 0.3 MA/cm^2 to 0.34 MA/cm^2. This difference is also 10 times greater or one order of magnitude higher than that of Onabe et al. and unexpected.

Therefore, due to the critical nature of each of the numerous parameters discussed in the original specification and the unexpected results achieved due to the claimed values of these parameters, the claimed invention could not be obvious to one of ordinary skill in the art.

Conclusion:

Therefore claims 1 and 4 are believed to be allowable for at least the reasons noted above. Because claims 3 – 11 depend directly or indirectly from claims 1 and 4, they are believed to be allowable for at least the same reasons as claims 1 and 4 are believed to be allowable.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date November 6, 2007 By _____

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